

An assessment of aquatic radiation pathways in Ireland

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The Radiological Protection Institute of Ireland, RPII, implements a comprehensive programme to monitor radioactivity in the Irish marine environment. The primary objective of this monitoring programme is to assess the exposure to the Irish population from anthropogenic radioactive contamination of the Irish marine environment.

Anthropogenic radioactivity in the marine environment can result in exposure to the population via consumption of contaminated seafood and via external radiation exposure when walking on beaches, swimming in the sea, etc. Dose assessments are made by combining marine monitoring data with habit data such as fish and shell fish consumption rates, beach occupancy rates and occupational exposure such as fishermen handling fishing gear. The RPII monitoring programme has consistently shown that the dominant pathway by which anthropogenic radioactive contamination of the marine environment results in radiation exposure of the Irish population is the consumption of fish and shellfish from the Irish Sea. This exposure is primarily due to authorised discharges from the Sellafield nuclear reprocessing plant, UK, into the Irish Sea.

Previously no detailed surveys had been undertaken in Ireland of habit data used to assess radiation doses from radioactivity in the marine environment. Instead dose assessments were made on the basis of assumed data inferred from habit surveys undertaken elsewhere or from national average consumption figures. Consequently the RPII decided to undertake a habits survey concentrating on the north east coastline, the Irish coastline closest to the Sellafield nuclear reprocessing plant, in order to improve the accuracy of its dose assessments.

Following a tender process the Centre for Environment, Fisheries & Aquaculture Science, Cefas, UK, were commissioned to undertake the habits survey.

Its report [1] provides an assessment of aquatic radiation exposure pathways in Ireland relating to anthropogenic radioactivity in the Irish Sea. It comprises:

- The results of a habits survey undertaken on the north-east coast of Ireland
- A dose assessment of two high rate seafood consumers using the habits survey data, and monitoring data provided by RPII
- Recommendations for changes to the east coast of Ireland marine monitoring

The habits survey was conducted in 2008 to obtain seafood consumption rates, intertidal occupancy rates, handling rates of commercial fishing gear and catch, and handling rates of sediment, for members of the public in Ireland. For coastal aquatic pathways, the survey area was defined as Omeath to Clogherhead in Co. Louth, and for fishing ports and harbours, the survey area was defined as Carlingford in Co. Louth to Howth in Co. Dublin. The consumption of seafood from the Irish Sea and Carlingford Lough was included. Interviews were conducted and data collected for some 535 individuals.

Dose assessments were undertaken for two groups of high-rate seafood consumers, Group A and Group B. Group A was assumed to consume 26 kg/y of fish and 10 kg/y of crustaceans, and group B to consume 25 kg/y of molluscs. The annual committed effective dose for Group A and Group B will be discussed and compared with the corresponding doses for the RPII's previously derived notional "typical" and "heavy" seafood consumers.

The Cefas report broadly endorses the RPII's marine monitoring programme and recommends that it be continued with minor improvements. Implementation of these recommendations will also be discussed.

[1]An assessment of aquatic radiation pathways in Ireland, 2008

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